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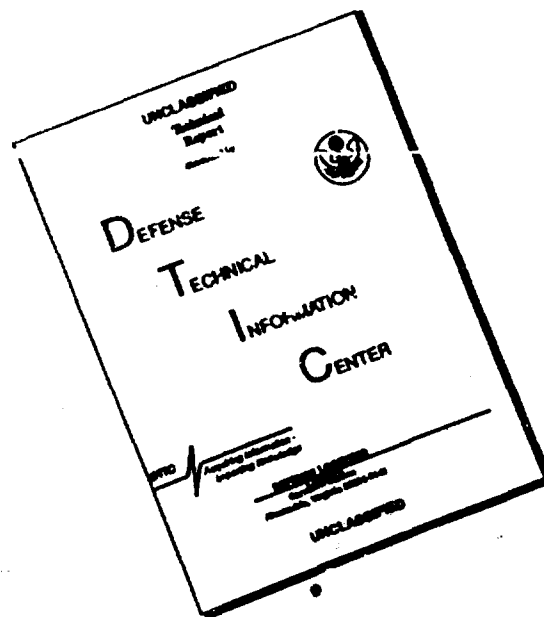
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THE INFLUENCE ON MALARIA INCIDENCE  
OF DISTANCE FROM ANOPHELES BREEDING PLACES

by

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In June to August, 1941, certain Children's Homes were evacuated from Moscow to the city of Naberszhnyye Chelny in the Tatar ASSR and to villages in the neighbourhood of that city. We have been able to collect some data, for the year 1942, re the incidence of malaria among the children from three of the homes.

The city of Naberszhnyye Chelny ( $55^{\circ} 31'$  North and  $51^{\circ} 45'$  East of Greenwich) is situated on the left bank of the Kama, on the river Chelninka, which empties into the Kama within the boundaries of the city. There is a great concentration of pools of water, breeding places of Anopheles mosquitoes, on the opposite right bank of the Kama. Within the urban zone the river Chelninka is non-anophelogenic (the banks are argillaceous, devoid of vegetation), but beyond the city the character of its banks changes, and in places there is stagnant water. The presence of vegetation creates favourable conditions for the hatching of Anopheles. To the south-west of the city, at a distance of 1-2 km., temporary pools are formed in a grove of trees after the subsidence of the spring high water. They last half-way through the summer, along with an insignificant number of permanent Anopheles breeding pools. The mosquitoes fly into the city mainly from the other side of the Kama, which in the neighbourhood of Naberszhnyye Chelny attains a width of about 1.5 km.

Between the breeding pools and the banks of the Kama there lies a small settlement of water transport workers, which forms, as it were, a barrier shielding the city to some extent, since the bulk of the mosquitoes stays in this settlement. The vector is Anopheles maculipennis messeae.

The temperature of the hottest month (July) is from 20 to 22 degrees Centigrade in different years, and is perfectly favourable for the complete cycle of sporogenesis in the mosquito. Not only Pl. vivax but also Pl. falciparum.

In the years 1935 and 1938, outbreaks of malaria were recorded in Naberszhnyye Chelny district; in 1935, the figures were 502.4 primary returns

per 100,000 population, and in 1938, 511.8. From 1935 to 1941, the primary returns did not exceed 260.0 per 10,000 population. Again in 1942 an upsurge was noted, and 2206 primary returns were recorded, or 441.2 per 10,000 population.

For Naberezhnyye Chelny City, 351 primary returns per 10,000 population were recorded in 1942. About 70% of all primary returns were noted in the first half of 1942; that is, the infection of these persons took place in the summer and autumn months of 1941.

Of the species of malarial parasites, the most prevalent is, in the main, Pl. vivax. In nine cases, Pl. falciparum was detected in Naberezhnyye Chelny in 1942.

In the evacuated children's homes, the children were of pre-school age, for the most part four to five years old. There are no exact data on the previous incidence of malaria among them, but according to the statements of the physicians attached to these homes, the children (with one or two exceptions) had not suffered from malaria in Moscow. However, in the autumn of 1941, after their arrival in the Naberezhnyye Chelny district, isolated cases were recorded: in Children's Home No. 4, there were five cases of malaria.

Seventy-five children from this home had been installed in a building standing right on banks of the Kama at the edge of the city, near the grove. The mosquitoes arrived from across the river, with additional mosquitoes from the breeding places in the grove at a distance of 1 km. from the home. In an examination of the out-buildings on the estate, in the period June to August, 1942, Anopheles mosquitoes were detected in considerable numbers. Part of the children's dormitories had their windows towards the river and the windows were not screened. During 1942, there were 12 children (16%) ill of malaria (likewise four of the personnel in charge). Of the twelve, eight were taken ill during the first half of 1942 and eleven of them received the infection at Naberezhnyye Chelny; in only one case was there already malaria in the anamnesis. Pl. vivax was found in the blood of the patients.

Children's Home No. 6, with sixty children, was installed in the center of the city at a distance of about 0.7 or 0.8 km. from the Kama, on a street running at right angles to the river. An inspection (a single inspection) of the buildings in August 1942 did not result in any Anopheles being found. Five of the children were stricken (all in the first half of 1942), or 8.3%. In these cases, Pl. vivax was detected.

Children's Home No. 12, with 176 children, was installed in the village of Orlovka, which is back of Naberezhnyye Chelny City, (inland from the Kama) at a distance of about 5 km. from the river. Between the city and Orlovka Village lies the town of Krasnyye Chelny. In the immediate vicinity of Orlovka, the river Chelninka passes. This river is anophelogenic in spots, but has only a small larva density. No inspection of the premises for the winged forms of the insect was made. Five cases of malaria were noted among the children (the diagnosis being based only on the clinical picture), or 2.8%.

A synopsis of the data for all three homes is given in the table, which clearly shows a maximum incidence of the disease among the children in the home beside the river, and a minimum incidence in the home located 5 km. away from the river.

Incidence of Malaria among the Evacuated Children

Children's Home	Location	Distance from Kama	No. of Children	No. of Primary Returns	% of Cases in Total No. of Children
No. 4	Nabershnyye Chelny	Banks of Kama	75	12	16.0
No. 6	Nabershnyye Chelny	0.7-0.8 km.	60	5	8.3
No. 12	Orlovka	about 5 km.	176	5	2.8

The effect on malaria incidence of distance from the Anopheles breeding places to dwelling premises also shows up in the adult population: the greatest number of cases was noted in the settlement of water transport workers and among people living on streets by the river; the farther inland from the river, the less the number of malaria cases recorded.

All the cases of malaria among the children were of medium gravity. Every case was given a systematic course of treatment with aprichine. Throughout August and September of 1942, the children at homes No. 7 and No. 6 were on a chemoprophylactic regimen.